

INSECT PEST SURVEY BULLETIN

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THE MORE IMPORTANT RECORDS FOR MARCH, 1933

The army cutworm is causing damage to wheat and oats in central and southern Kansas, and the entire northwestern part of Oklahoma.

A heavy infestation of Hessian fly flaxseeds extends across central Missouri. Infestation is also rather heavy in south-central Nebraska. Wheat sown after the fly-free date in the East Central States appears to be in good condition. That sown prior to this date in western Illinois is carrying a 36 per cent infestation.

Survival of the sugarcane borer is unusually light in Louisiana owing apparently to severe cold in early February.

In the northern part of the East Central States codling moth mortality ran as high as 50 per cent. This is probably associated with temperatures ranging below 25° below zero during the winter.

The first adult of the oriental fruit moth emerged in southern Georgia March 12 and in South Carolina March 24. No emergence has been reported from the States farther north.

The plum curculio started leaving hibernation in numbers during the last week in March in Georgia. This is about the normal time for emergence.

Considerable damage has been done to orange by the green citrus aphid throughout a large part of the peninsula of Florida. The damage, however, is not so severe as in previous outbreaks.

Buffalo gnats are again appearing in the Mississippi Delta and a few deaths of livestock have been reported.

In this number of the Survey Bulletin we are publishing a summary of insect conditions during 1932 in Brazil and Costa Rica.

GENERAL FEEDERS

CUTWORMS (Noctuidae)

Virginia. H. G. Walker (March 25): Cutworms are moderately abundant.

Kansas. H. R. Bryson (March 25): Army cutworms (Chorizagrotis auxiliaris Grote) have been causing considerable damage to wheat and to some oats in a number of counties. There may be more than one species of worms involved, but they

have not been determined at the present writing. Injury began very early in the southern part of the State. The worms became active at Kingman when the temperature began to rise about two days following a drop to 14 degrees below zero. Reports of injury to wheat and some oats have been received since March 10 from Sumner and Cowley Counties, where injury has been the greatest; Kingman, Harvey, McPherson, and Sedgwick Counties, where injury has been next in severity; and Reno, Russell, and Saline Counties, where injury has been least severe. Two reports from Salina and Mont Hope stated that the worms were injuring alfalfa. They are rather plentiful at Manhattan, but thus far no injury has been reported.

Oklahoma. C. F. Stiles (March 22): Cutworms are very abundant in wheat and alfalfa fields in western Oklahoma. The western army cutworm (C. auxiliaris) at this time is present in large numbers in Noble, Garfield, Blaine, and Major Counties and from meager reports I understand that the entire north-western part of the State is infested. Some wheat fields have been severely damaged and alfalfa is showing effects of injury. Owing to the wide distribution of these pests over the fields, farmers do not think it is practical to poison at this time. If weather conditions are favorable for their development, we may expect serious damage to some wheat fields.

Louisiana. W. E. Hinds (March 28): Cutworms are moderately abundant in gardens and on young corn at Baton Rouge.

Utah. G. F. Knowlton (March 21): Cutworms are moderately abundant in some pastures in Tooele County.

#### ARMYWORM (Cirphis unipuncta Haw.)

South Carolina. F. Sherman (March 25): An adult was taken in a light trap at Clemson College March 18.

#### WHITE GRUBS (Phyllophaga spp.)

West Virginia. L. M. Peairs (March 23): White grubs are moderately abundant at Morgantown. They are beginning to show in early plowing.

Indiana. J. J. Davis (March 27): Anticipate white grub trouble in 1933.

Illinois. W. P. Flint (March 22): From present information on white grub damage and a partial survey made in the fall of 1932, nearly one-fourth of the fields in northern Illinois show a population sufficient to cause damage to corn during the summer of 1933. These grubs are a mixture of both Brood A and Brood B, Brood A being by far the more abundant, although serious damage from Brood B may also occur during the early part of the season. Population counts in this section of the State show that most timothy and blue-grass fields carry from 10 to 35 grubs per square yard.

J. H. Bigger (March 24): White grubs are very abundant-about the same as in 1930 in western Illinois.

Iowa. C. J. Drake (March 21): White grubs, Brood A, are very abundant.

Wisconsin. C. L. Fluke (March 24): The white grubs should be unusually destructive this season, at the second year of the cycle, Brood "A", is due in Wisconsin.

Missouri. L. Haseman (March 22): Two species of June beetles were abundant in the surface 6 inches of soil at Columbia, March 15 to 18.

Louisiana. W. E. Hinds (March 28): During a period of warm nights at about the middle of March, Phyllophaga congrua<sup>Lec</sup>/adults were flying in quite large numbers.

#### WIREWORMS (Elateridae)

Kentucky. W. A. Price (March 24): A corn wireworm (Melanotus sp.) was found doing serious damage to lettuce at St. Matthews on March 10.

Alabama. K. L. Cockerham (March 14): Larvae of Heteroderes laurentii Guer. were found very plentiful in experimental plats of corn which had been planted on March 1 at Foley. The corn was sprouting and some of it was just coming through the ground. The average for the 1/4-acre plat was nearly 1 larva per linear foot. Examination of the sprouting grain showed that no damage had been committed. It seemed that the larvae were just locating the grain and collecting near it. Feeding will no doubt begin in the very near future. The warming of the soil will no doubt see great activity and feeding of the larvae. Random examinations of the Irish potato plats showed that there was apparently no damage by this insect to the potato seed pieces. Larvae were comparatively scarce in the rows. The plats examined were planted on Feb. 15 and 22.

Missouri. L. Haseman (March 22): Recent observations indicate a scarcity of wireworms in central Missouri.

Oklahoma. C. F. Stiles (March 22): Wireworms are doing considerable damage to early gardens in Bryan County. They are moderately abundant in gardens in south-central Oklahoma.

California. A. E. Michelbacher (March 19): Wireworms (Anchastus cinereipennis Esch.) are scarce at Rio Vista.

#### A MOLE CRICKET (Scapteriscus acletus R. & H.)

Mississippi. C. Lyle (March 23): On Feb. 21 a correspondent at Biloxi, Harrison County, sent us specimens and wrote as follows: "About two or three days after I plant seed these crickets, or "puppies", run through them and cut them out."

### CEREAL AND FORAGE - CROP INSECTS

#### WHEAT

#### HESSIAN FLY (Phytophaga destructor Say)

Ohio. T. H. Parks (March 24): The Hessian fly is scarce.

Illinois. J. H. Bigger (March 24): Ninety per cent of the wheat was seeded after the safe-sowing date in western Illinois last fall. During the winter it has been found to contain 3.2 per cent infestation. The other 10 per cent is found to have 36 per cent infestation.



Nebraska. M. H. Swenk (March 1 to 25): The infestation by the Hessian fly in south-central Nebraska shows considerable strength at this time. The old volunteer wheat is especially heavily infested in some localities. In northern Webster County the surviving main crop of wheat shows an infestation of about 2 puparia per plant.

Iowa. C. J. Drake (March 21): The Hessian fly is moderately abundant in Monona County but much lighter elsewhere.

Missouri. L. Haseman (March 22): The situation is rather alarming across central Missouri and in southeastern Missouri. The heavy crop of "flaxseeds" seem to be passing the winter in good condition.

#### CHINCH BUG (Blissus leucopterus Say)

Ohio. T. H. Parks (March 24): The chinch bug is moderately abundant and threatens damage in some localities.

Iowa. C. J. Drake (March 21): Chinch bugs are moderately abundant. In 15 or 16 counties the infestation is spotted.

H. E. Jaques (March 23): There is an abundance of chinch bugs on warm days in southeastern Iowa, and in limited areas in southwestern Iowa.

Missouri. L. Haseman (March 22): Recent counts in some clump grasses indicate that approximately 40 per cent of the adults are dead. However, large numbers are surviving the winter.

#### AN ARCTIID MOTH (Apantesis phalerata Harr.)

Nebraska. M. H. Swenk (March 1 to 25): During the second week in March caterpillars of A. phalerata occurred in great abundance in Scotts Bluff County, and were reported as destroying the wheat in some fields in that locality.

#### ALFALFA

##### ALFALFA WEEVIL (Hypera postica Gyll.)

California. A. E. Michelbacher (March 19): Starting about Feb. 22, larvae could be collected with considerable ease at Pleasanton and Niles. Since that time they have become more abundant. In one of the more heavily infested fields at Pleasanton 227 larvae were collected per 100 sweeps on March 17 whereas in a heavily infested field at Niles 398 larvae were collected with a like number of sweeps on March 13. In the area around Tracy the weevil has made its appearance for the first time this season. At Tracy proper the first larvae were collected on March 17. Here in a field under observation 5 larvae to 100 sweeps were collected. At Vernalis, which is 12 miles from Tracy, the first larvae and adults were collected on March 9. At that time 12 were taken to 100 sweeps, while on March 17 the average per 100 sweeps was 40. In all there are eight fields in which we are making population studies, and in every one the population is rising from week to week. The alfalfa at the present time is from a fourth to probably a little more than three-eighths grown.

COWPEA APHID (Aphis medicaginis Koch)

California. A. E. Michelbacher (March 19): In the alfalfa fields at Vernalis aphids were collected in large numbers on the 17th of March. On the same date they were collected in rather large numbers at Tracy.

SUGARCANE

A WEEVIL (Anacetrinus subnudus Buchanan)

Louisiana. W. E. Hinds (March 28): The sugarcane rootstock weevil occurs abundantly and in all stages (except eggs not found) in third year stubble of P.O.J. 213 which was being destroyed at the middle of March. Among root stocks, 71.2 per cent were infested. Among the eyes 31.5 per cent had been destroyed. Among the weevil stages found the natural mortality was 29.5 per cent.

SUGARCANE BEETLE (Eutheola rugiceps Lec.)

Louisiana. W. E. Hinds (March 29): Sugarcane beetle adults in hibernation are much more scarce than one year ago. Much less evidence of beetles feeding in August and early September planted cane was seen last fall. We anticipate but slight general damage this spring.

A SCARABID (Dyscinetus trachypygus Burm.)

Louisiana. W. E. Hinds (March 28): During a period of warm nights at about the middle of March, some specimens of Dyscinetus trachypygus were flying in quite large numbers.

SUGARCANE BORER (Diatraea saccharalis Fab.)

Louisiana. W. E. Hinds (March 28): Sugarcane borer survival of hibernation is unusually light, due apparently to severe cold of early February followed by souring of cane and rapid decomposition of thicker parts of trash. Destruction of tops by burning during January was unusually thorough also. Some complaint of deadhearts in young sprouts from planted cane due to borer larvae in the seed cane. First adult moth emerged from pupae taken from old corn stalks late in February.

F R U I T I N S E C T S

APPLE

APHIDS (Aphidae)

Connecticut. W. E. Britton (March 24): Fruit aphid eggs are scarce.

Delaware. L. A. Stearns (March 25): Fruit aphid eggs are apparently somewhat less abundant than usual.

West Virginia. L. M. Peairs (March 23): Fruit aphid eggs are moderately abundant at Morgantown. Three species are present in undetermined proportions.

Georgia. C. H. Alden (March 18): The green apple aphid is still in the egg stage at Cornelia.

Wisconsin. C. L. Fluke (March 24): Plant lice, especially those on fruit trees, do not appear to be so numerous this year as they were last spring, since the eggs are not anywhere near so numerous.

Alabama. J. M. Robinson (March 21): The woolly apple aphid (Eriosoma lanigerum Hausm.) is moderately abundant on apple at Pisgah.

Oregon. D. C. Mote (March 22): Fruit aphids on prunes in Albany were noticed hatching March 13.

#### LEAFHOPPERS (Cicadellidae)

Missouri. L. Haseman (March 22): There is a very heavy crop of leafhoppers hibernating in the rubbish in orchards in central and northeastern Missouri.

#### SAN JOSE SCALE (Aspidiotus perniciosus Comst.)

Delaware. L. A. Stearns (March 25): The San Jose scale is rather more abundant than usual, especially in unsprayed orchards.

Virginia. W. J. Schoene (March 28): Frequent scouting in several localities in the State indicate a scarcity of the San Jose scale. It appears that the scale is being held in check by some parasite, as the infestation is declining rapidly on unsprayed trees. It is only now and then that we have been able to locate a severe infestation, and then on young plants.

West Virginia. L. M. Peairs (March 23): The San Jose scale is moderately abundant on several isolated trees at Morgantown.

Georgia. O. I. Snapp (March 17): The average percentage of scale alive on February 4 was  $92 \pm 1.34$  and the average percentage alive on March 17 was  $75.2 \pm 0.9$ . This reduction of 22.3 per cent is attributed to the cold weather in February, when the minimum temperature was 11.9 degrees F. above zero.

Indiana. J. J. Davis (March 27): The San Jose scale is moderately abundant.

Iowa. H. E. Jaques (March 23): The San Jose scale is moderately abundant in Lyon, Bremer, Guthrie, and Hancock Counties, and very abundant in Delaware County.

Louisiana. W. E. Hinds (March 28): San Jose scale is moderately abundant on deciduous fruit trees at Baton Rouge.

Oregon. D. C. Mote (March 22): The San Jose scale is moderately abundant in Salem on apple--about 40 per cent mortality.

#### OYSTER-SHELL SCALE (Lepidosaphes ulmi L.)

Indiana. J. J. Davis (March 27): The oyster-shell scale is moderately abundant.

Wisconsin. C. L. Fluke (March 24): The oyster-shell scale is more abundant than usual and nearly every new scale has eggs under it, although by examination about half of them are dead. I have not examined very many scales, but those seen show the above condition.

Oregon. D. C. Mote (March 22): A heavy infestation was observed on apple in the Imbler section, Union County, March 20, reported by H. G. Avery.

#### CODLING MOTH (Carpocapsa pomonella L.)

Delaware. L. A. Stearns (March 25): There is no pupation of the codling moth yet.

New York. P. J. Parrott (March 22): Overwintering larvae are very abundant.

West Virginia. L. M. Peairs (March 23): Numerous larvae on unsprayed trees have been reported at Morgantown.

Georgia. C. H. Alden (March 18): No pupation of hibernating larvae to date at Cornelia.

Indiana. J. J. Davis (March 27): The codling moth is moderately abundant.

Illinois. W. P. Flint (March 22): A recent examination of hibernating larvae showed a winter mortality of approximately 50 per cent. In northern Illinois the mortality is probably higher, as temperatures of 25° below zero were experienced in that part of the State.

Michigan. R. Hutson (March 22): The codling moth is overwintering in usual numbers.

Iowa. H. E. Jaques (March 23): The codling moth is moderately abundant in Clayton and Bremer Counties.

Missouri. L. Haseman (March 22): The subzero weather early in February killed about a fourth of the exposed larvae at Columbia, and similar reports come from other parts of the State.

#### EASTERN TENT CATERPILLAR (Malacosoma americana Fab.)

West Virginia. L. M. Peairs (March 23): The first hatching was observed March 22 in a sheltered place at Morgantown.

South Carolina. A. Lutken (March 27): Eastern tent caterpillars are abundant on wild cherries throughout the State.

Arkansas. W. J. Baerg (March 20): Larvae first emerged from the eggshells on March 14 at Fayetteville.

#### PEACH

##### PEACH BORER (Aegeria exitiosa Say)

New York. P. J. Parrott (March 22): Larvae are moderately abundant in western New York.

Missouri. L. Haseman (March 22): In untreated trees at Columbia the borers are very abundant and have just resumed activity for the season.



LESSER PEACH BORER (Aegeria pictipes G. & R.)

Georgia. O. I. Snapp (March 17): J. R. Thomson observed a female ovipositing on a peach tree today at Fort Valley. This is an unusually early record for that insect to be on the wing. Most of the spring-brood moths emerge in April in this latitude.

Alabama. J. M. Robinson (March 21): The lesser peach borer is moderately abundant on peach trees at Troy.

ORIENTAL FRUIT MOTH (Grapholitha molesta Busck)

New York. P. J. Parrott (March 22): Overwintering larvae are moderately abundant in western New York.

Delaware. L. A. Stearns (March 25): No pupation of the oriental fruit moth yet.

North Carolina. Z. P. Metcalf (March 29): The oriental fruit moth seems to be more abundant over the entire State than we have ever had it reported before. It is working in the tips of ornamental plants.

South Carolina. F. Sherman (March 25): Adults were emerging in cages on March 24 at Clemson College.

Georgia. W. H. Clarke (March 12): The first adult to emerge in the insectary at Thomaston was noted on March 12.

Indiana. J. J. Davis (March 27): The oriental fruit moth is moderately abundant.

PLUM CURCULIO (Conotrachelus nenuphar Hbst.)

Delaware. L. A. Stearns (March 25): No emergence of the plum curculio as yet.

South Carolina. F. Sherman (March 25): The first adult was jarred from plum at Clemson College, March 23.

Georgia. O. I. Snapp (March 17): A grower reports the first adult from hibernation at Fort Valley today. We have failed to capture any by jarring. A lighter than average infestation is anticipated on account of the very light peach crop last year and the cold weather in February. (March 23): Adults are now leaving hibernation in numbers. This is about the normal time for them to leave hibernation, and consequently a second brood can be expected this year unless abnormal conditions occur during the pupation season. Hiley peaches are in full bloom and Elbertas will be in full bloom within another week. Therefore, the curculio has appeared in peach orchards this year well in advance of the time for the petal-fall application of spray.

W. H. Clarke (March 15): First adults were caught on jarring frames at Thomaston on March 15.

C. H. Alden (March 18): No adult emergence to date at Cornelia.

PRUNE

PEAR THRIPS (Taeniothrips inconsequens Uzel)

Oregon. D. C. Mote (March 22): The prune thrips, T. inconsequens, was emerging from the ground March 14.



CHERRY

CHERRY CASE BEARER (Coleophora pruniella Clem.)

Wisconsin. C. L. Fluke (March 24): The cherry case bearer went into winter quarters almost as numerous as the year before, and we are therefore looking for a heavy crop of this insect. It is entirely localized in the Door County peninsula.

GRAPE

GRAPE LEAFHOPPER (Erythroneura comes Say)

Utah. G. F. Knowlton (March 15): Grape leafhoppers are becoming active on warm afternoons at Logan, and are sometimes abundant among the dry leaves under Virginia creeper bushes.

PECAN

PECAN SESIA (Aegeria scitula Harris)

Mississippi. C. Lyle (March 23): A slight infestation in pecan trees was reported from Kosciusko, Attala County, on March 18.

PECAN CASE BEARER (Mineola juglandis LeB.)

Georgia. F. G. Moznette (March 21): The immature larvae of the pecan leaf case bearer are commencing to emerge from their hibernating quarters and feeding on the buds of the pecan in the vicinity of Albany. The emergence usually coincides with the swelling and opening of the buds in the spring. The activity of the buds at this time indicates that growth development is about ten days earlier than in 1932.

PECAN COSSID (Cossula magnifica Stkr.)

North Carolina. R. W. Leiby (March 27): The pecan cossid seems to be more numerous than usual. Larvae causing the damage are nearly full grown. The damage is moderate. Attacking pecan trees in the eastern part of the State.

HICKORY SHUCK WORM (Laspeyresia caryana Fitch)

Georgia. G. F. Moznette (March 21): H. S. Adair. The first emergence of the overwintering generation moths from shucks kept outdoors under normal conditions was recorded on March 13 at Albany. The first emergence in 1932 occurred on February 23. The buds of both pecan and hickory have just begun to grow and a few leaflets are appearing on some trees.

CITRUS

GREEN CITRUS APHID (Aphis spiraecola Patch)

Florida. E. W. Berger (March 22): The Chinese ladybeetle (Leis conformis Fdv.), introduced in 1925 to assist in the control of the green citrus aphid, has been observed by Plant Board inspectors as becoming unusually abundant in the Sand Lake area, southwest of Orlando.

J. R. Watson (March 27): The citrus aphid is seen everywhere in the peninsula part of the State. The damage to oranges has been considerable, but not nearly so great as during some other years. It seems likely that there will be considerable damage to tangerines. The Chinese ladybeetle, Leis. imported in 1924-25, is present in large numbers in an area over a radius of 5 miles in Orange County. This ladybeetle, during the summer time when aphids are scarce, has been seen feeding on the extra-floral nectaries of Crotalaria striata, as well as on gum from injured citrus trees.

Louisiana. W. E. Hinds (March 28): Aphis spiraeicola are beginning to multiply.

CITRUS WHITEFLY (Dialeurodes citri Ashm.)

Georgia. J. B. Gill (March 23): The citrus whitefly is moderately abundant on Satsuma orange and ornamentals, at Albany and in southern Georgia.

Florida. J. R. Watson (March 4): The citrus whitefly is moderately abundant. Commencing to emerge in Polk County and south, the adults are beginning to appear on tender foliage and the infestation seems to be of about average intensity.

E. W. Berger (March 22): An unusually abundant fall and winter development of the red Aschersonia (red whitefly fungus), an important entomogenous fungus that destroys whiteflies in Florida, has been reported from the Fort Pierce area on the Florida east coast by a correspondent.

Louisiana. W. E. Hinds (March 28): Citrus whitefly is moderately abundant in southern Louisiana. Satsumas defoliated but plenty survived on privets.

COTTONY-CUSHION SCALE (Icerya purchasi Mask.)

Georgia. J. B. Gill (March 23): Infestations have occurred recently in southern Georgia at Donelsonville, Bainbridge, Calvary, Cairo, Pelham, Thomasville, Quitman, Moultrie, Baxley, Claxton, Sea Island Beach, St. Marys, Cordele, and Albany. The plants infested included Pittosporum, Nandina, Spiraea, rose, Euonymus, Buxus, Satsuma orange, grapefruit, Citrus trifoliata, and pecan. The office of State Entomologist, through its field Station located at Albany, has furnished colonies of Vedalia beetles (Rodolia cardinalis Muls.) in controlling the scale.

TRUCK - CROP INSECTS

VEGETABLE WEEVIL (Listroderes obliquus Gyll.)\*

Mississippi. C. Lyle (March 23): Complaints of injury to turnips were received during the past month from Neshoba, Stone, Leake, Attala, Holmes, Lauderdale, and Smith Counties. The most serious complaint, however, came from Hattiesburg in Forrest County from a correspondent who wrote as follows: "These insects have consumed several rows of carrots and are found eating into the root of this vegetable; they have also destroyed my parsley, mustard, and other greens."

\*Correction: Insect Pest Survey Bulletin, Summary Number for 1932: Distribution map of the vegetable weevil. Harris County, Texas, should be Harrison County in northeastern Texas.

Louisiana. W. E. Hinds (March 28): The vegetable weevil is doing considerable damage, especially by adults to tomatoes, turnips, mustard, etc. Larvae are less abundant at this time.

GREEN JUNE BEETLE (Cotinis nitida L.)  
JAPANESE BEETLE (Popillia japonica Newm.)

Pennsylvania. R. C. Burdette (March 28): Insects in general have not made any appearance in the State with the exception of white grubs (Cotinis nitida L.) and Popillia japonica infesting cold frames and seed beds in the lower section of the State.

SPOTTED CUCUMBER BEETLE (Diabrotica duodecimpunctata Fab.)

New Jersey. R. C. Burdette (March 28): In a trip to southern New Jersey on the 14th of March I found several spotted cucumber beetles in old cabbage fields.

Georgia. O. I. Snapp (February 24): The first adults of the season were observed today on wild plums at Fort Valley.

G. F. Moznette (March 21): The adults were observed March 8 in quite large numbers feeding on the new growth put out on peach trees set out in the fall of 1932.

Louisiana. W. E. Hinds (March 28): Spotted cucumber beetles are scarce. The larvae are beginning activity at Baton Rouge.

Texas. F. L. Thomas (March 22): The spotted cucumber beetle was moderately abundant at Sugarland, Ft. Bend County, feeding on spinach January 23.

STRIPED CUCUMBER BEETLE (Diabrotica vittata Fab.)

Florida. J. R. Watson (March 27): Striped cucumber beetles are very abundant in the Everglades.

WESTERN SPOTTED CUCUMBER BEETLE (Diabrotica soror Lec.)

Oregon. B. G. Thompson (March 22): The 12-spotted cucumber beetle is beginning to disperse in small numbers over clover fields.

SEED CORN MAGGOT (Hylemyia cilicrura Rond.)

Virginia. H. G. Walker (March 25): The seed corn maggot is moderately abundant.

South Carolina. A. Lutken (March 27): The seed corn maggot is generally moderately abundant on English peas and onions.

Mississippi. C. Lyle (March 23): Medium injury to onions was reported from Durant, Holmes County, on March 16.

Texas. F. L. Thomas (March 22): The seed corn maggot is very abundant on beans and has been causing considerable injury to spinach at Carrizo Springs, Dimmit County. (S. E. Jones.)



CORN EAR WORM (Heliothis obsoleta Fab.)

Florida. J. R. Watson (March 27): The corn ear worm is moderately abundant, in peas especially.

Texas. F. L. Thomas (March 22): The corn ear worm is scarce at Winter Haven in Dimmit County. Adult taken March 9; first egg on cabbage March 14. (S.E.Jones.)

APHIDS (Aphidae)

Virginia. H. G. Walker (March 25): Aphids of all kinds are rather scarce in the Norfolk area.

Louisiana. W. E. Hinds (March 28): Aphids generally are unusually scarce, however it has been noted that hymenopterous parasites are quite abundant where aphids do occur in any considerable number. Species of root lice occur on strawberries, cabbage, etc.

ONION THRIPS (Thrips tabaci Lind.)

Florida. J. R. Watson (March 27): The onion thrips severely damaged 5 acres of celery at Oviedo in Seminole County. It has been very injurious to onions all over the state.

POTATO

COLORADO POTATO BEETLE (Leptinotarsa decemlineata Say)

New York. P. J. Parrott (March 22): Overwintering beetles are scarce.

Florida. J. R. Watson (March 27): Colorado potato beetles are moderately abundant from Gainesville north and west, and in the Hastings area.

Alabama. K. L. Cockerham (March 14): The first Colorado potato beetle noticed this season was found in a plowed field on March 14.

Louisiana. W. E. Hinds (March 28): Colorado potato beetles are scarce in southern Louisiana. They began emerging about the third week in March.

BEANS

MEXICAN BEAN BEETLE (Epilachna corrupta Muls.)

New Jersey. R. C. Burdette (March 28): Mexican bean beetles were scarcer in hibernation than in previous years.

South Carolina. F. Sherman (March 25): One or two Mexican bean beetles have been out in cages at Clemson College daily since March 14.

Indiana. J. J. Davis (March 27): The Mexican bean beetle will probably be destructive in the southern half of the State.

CABBAGE

IMPORTED CABBAGE WORM (Ascia rapae L.)

South Carolina. F. Sherman (March 25): Adults were in flight at Clemson College March 21.

Missouri. L. Haseman (March 22): Usually butterflies are on the wing before this at Columbia, but to date none has been seen.

Louisiana. W. E. Hinds (March 28): Cabbage butterflies and loopers are unusually scarce but egg-laying is now increasing at Baton Rouge.

DIAMOND-BACK MOTH (Plutella maculipennis Curt.)

Texas. F. L. Thomas (March 22): Heavy emergence of the diamond back moth on March 10 at Laredo was reported by S. E. Jones.

HARLEQUIN BUG (Murgantia histrionica Hahn)

South Carolina. F. Sherman (March 25): First adults were seen in the field at the insectary, Clemson College, about March 18.

CABBAGE APHID (Brevicoryne brassicae L.)

Mississippi. C. Lyle (March 23): Specimens were received from Zama, Attala County, on March 18, with a report that a medium infestation had appeared on collards.

SQUASH

SQUASH BUG (Anasa tristis DeG.)

Utah. G. F. Knowlton (March 22): Adults are active at Logan on warm days.

CUCUMBERS

MELON WORM (Diaphania hyalinata L.)

Florida. J. R. Watson (March 27): The melon worm is reported as destroying a whole field of cucumbers near Miami. In a squash field at Winter Haven, in Polk County, a single wormy squash was seen. Cucumber beetles are reported as doing considerable damage in the Everglades district.

STRAWBERRY

STRAWBERRY WEEVIL (Anthonomus signatus Say)

Louisiana. W. E. Hinds (March 28): The strawberry weevil (A. signatus) adults were feeding actively on the buds of wild blackberries at about the middle of March. No complaint as yet on strawberries.

COMMON RED SPIDER (Tetranychus telarius L.)

Louisiana. W. E. Hinds (March 28): Strawberry red spiders became abundant following the February freeze and considerable dusting with sulfur has been applied for their control.

BEETS

BEET LEAFHOPPER (Eutettix tenellus Baker)

Utah. G. F. Knowlton (March 21): Beet leafhoppers are moderately abundant in Tooele County. A few overwintering ones were active yesterday.

MUSHROOM

MUSHROOM MITE (Tyroglyphus lintneri Osborn)

California. E. O. Essig (March 20): The mushroom mite is abundant in commercial houses in the San Francisco Bay district.

CELERY

CELERY LEAF TIER (Phlyctaenia rubigalis Guen.)

Florida. J. R. Watson (March 27): There has been very little evidence of the celery leaf tier.

TOBACCO

A CARABID BEETLE (Geopinus incrassatus Dej.)

North Carolina. R. W. Leiby (March 25): Adults are reported commonly in tobacco plant beds, apparently uprooting seedling plants in search for insects upon which to feed, and therefore causing considerable injury.



F O R E S T   A N D   S H A D E - T R E E   I N S E C T S

BROWN-TAIL MOTH (Nygmia phaeorrhoea Don.)

Maine. H. B. Peirson (March 22): Large numbers of overwintering nests have been found in Limerick, Newfield, Shapleigh, and Alfred.

SPRING CANKER WORM (Paleacrita vernata Peck)

Missouri. L. Haseman (March 22): On the night of March 13 there was a very heavy flight of male moths at Columbia. On March 19 and 20 we had rain, sleet, and snow and a drop in temperature to about 20°F., which should have largely eliminated them.

Kansas. H. R. Bryson (March 25): The peak of emergence of the spring canker worm was reached on March 12.

ASH

BANDED ASH BORER (Neoclytus caprea Say)

Nebraska. W. H. Swenk (March 10): Infestations were especially reported from Greeley, Red Willow, and Cheyenne Counties during January.

BEECH

BEECH SCALE (Cryptococcus fagi Baer.)

Maine. H. B. Peirson (March 22): Further scouting for the beech scale has resulted in its discovery in these additional towns: Whitney, Pembroke, Perry, Robinson, Whitneyville, and Northfield.

ELM

A FLEA BEETLE (Haltica ulmi Woods)

Connecticut. W. E. Britton (March 24): Received from Canaan March 14 from a correspondent who found the beetles in great numbers at the base of an elm tree.

EUROPEAN ELM SCALE (Gossyparia scabra Mod.)

Nebraska. W. H. Swenk (March 1 to 25): Elm branches heavily infested with the European elm scale were received from Fairbury, Jefferson County, during the first week in March.

FIR

AN-APHID (Dreyfusia picea Ratz.)

Maine. H. B. Peirson (March 22): A large area of balsam fir has been killed in Manchester. This insect is increasing at an alarming rate.

JUNIPER AND CEDAR

DEODAR WEEVIL (Pissodes deodarae Hopk.)

Mississippi. C. Lyle (March 23): Although no specimens were sent in, correspondents at Decatur, Newton County, and Louisville, Winston County, recently wrote us regarding injury to Cedrus deodara which had evidently been caused by P. deodarae.

PINE

SOUTHERN PINE BEETLE (Dendroctonus frontalis Zimm.)

Pennsylvania. J. N. Knull (March): A recent survey indicates that the southern pine beetle is doing considerable damage to stands of pine in Franklin, Fulton, and Bedford Counties. Pitch, shortleaf, Virginia scrub, and white pines have been attacked.

AN APHID (Lachnus pini L.)

Massachusetts and Connecticut. E. P. Felt (March 24): Eggs of the pine aphid occur somewhat commonly on individual pines at Methuen, Mass., and are somewhat abundant on individual trees at Stamford, Conn.

PINE NEEDLE SCALE (Chionaspis pinifoliae Fitch)

Iowa. H. E. Jaques (March 23): The pine leaf scale is very abundant in Henry County.

Nebraska. M. H. Swenk (March 25): In December and again in February there were reports of spruce trees in Washington, Gage, Boone, and Scotts Bluff Counties seriously infested.

INSECTS AFFECTING GREENHOUSE  
AND ORNAMENTAL PLANTS

A WEEVIL (Polydrusus sericeus Shall.)

Connecticut. M. P. Zappe (March 24): This imported insect has been recorded from Ohio and Indiana. No records from the New England States have been seen, but it has been found on shrubs in the nursery. I have only 4 specimens: One, Greenwich, Conn., June 6, 1928; one, Thompsonville, Conn., June 20, 1932; and two, New Canaan, Conn., July 8, 1932.

A SCALE INSECT (Lepidosaphes newsteadi Sulc)

Connecticut. E. P. Felt (March 24): A scale insect, provisionally identified as L. newsteadi by Harold Morrison, has been found upon umbrella pine at Greenwich in sufficient numbers to affect materially the vigor of the tree.

WALNUT SCALE (Aspidictus juglans-regiae Comst.)

Mississippi. C. Lyle (March 23): A. juglans-regiae was taken on honeysuckle and tamarax at Greenwood, Leflore County, March 15; on Photinia serrilotta at Tupelo, Lee County, March 16; and on coral berry from Carthage, Leake County, March 2.

BARNACLE SCALE (Ceroplastes cirripediformis Comst.)

Georgia. J. B. Gill (March 23): The barnacle scale has been found infesting various plants at Albany and vicinity. Hackberry trees have been most severely attacked by this species.

GREENHOUSE CENTIPEDE (Scutigera immaculata Newp.)

Washington, D. C. F. F. Smith (March 22): During the fall of 1932 a florist in Washington, D. C., experienced serious losses to chrysanthemums which were growing in ground benches. Snapdragons and radishes planted in the same beds following the chrysanthemum crop have remained stunted or have died out because of the continued root injury. The florist stated that similar injury has been noted in his greenhouses for three years but that he had attributed it to other causes.

California. A. E. Michelbacher (March 19): In greenhouses the garden centipede has continued to do damage. In the Sacramento River Delta it has in several places done considerable damage to sugar-beet seedlings.

AZALEA LEAF MINER (Gracilaria azaleella Brants.).

Connecticut. E. P. Felt (March 24): The azalea leaf miner, presumably G. azaleella, was found curling and somewhat damaging azalea leaves at Greenwich.

GLADIOLUS

GLADIOLUS THRIPS (Taeniothrips gladioli M. & S.)

Florida. J. R. Watson (March 27): The gladiolus thrips did not do much damage to gladiolus plantings in Florida until the middle of March, but at the present time is doing severe damage in many plantations. The incidence of rapid breeding coincided with a marked rise in temperature. Apparently "glads" planted early in Florida will escape severe damage from this pest.

New York. P. J. Parrott (March 22): Gladiolus thrips are moderately abundant in western New York.

ORCHID

ORCHID WEEVIL (Etormerellus laevimargo Champ.)

Ohio. T. H. Parks (March 24): Specimens of the orchid weevil were brought to my office with the statement that they were injuring orchids in a Franklin County greenhouse.

ROSE

RED-NECKED CANE BORER (Agrilus ruficollis Fab.)

Ohio. T. H. Parks (March 21): The red-necked cane borer was found in Hugonis rose branches in a private planting in Columbus. This is a pest of raspberry and blackberry canes but has been reported before in rose plants. Roses were badly infested and injury to branches was very pronounced.



YEW

A SCALE INSECT (Aspidictus tsugae Marlatt)

Connecticut. D. P. Felt (March 24): A somewhat rare scale insect, provisionally identified by Harold Morrison as A. tsugae, was found in small numbers upon Taxus at Greenwich.

TURK'S CAP

A THRIPS (Frankliniella insularis Fkln.)

Florida. J. R. Watson (March 27): The West Indian flower thrips, F. insularis, was sent in from Stuart, where it was injuring Turk's cap.

I N S E C T S   A T T A C K I N G   M A N   A N D

D O M E S T I C   A N I M A L S

MAN

BOXELDER BUG (Leptocoris trivittatus Say)

Maryland. E. N. Cory (March 25): Many reports are coming in from Baltimore County, especially from the Green Spring Valley, of boxelder bugs invading houses. There are similar reports from Prince Georges County.

Kentucky. W. A. Price (March 24): Specimens were sent to the office for identification from Newcastle, Whites, and Louisville, with the statement that they were found on the sides of buildings in large numbers.

Iowa. H. E. Jaques (March 23): The boxelder bug is very abundant in Henry, Delaware, and Des Moines Counties.

Nebraska. M. H. Swenk (October 20 to February 28): A very large number of complaints of boxelder bugs in and around houses were received during the period from October 22 to November 30, and again during the entire month of February. These came particularly from the eastern counties, from Lancaster, Cass, Douglas, and Burt Counties west to Saline, York, Polk, Platte, Madison, and Pierce Counties. Considerable trouble of this sort was also reported in south-central Nebraska, especially in Kearney and Furnas Counties.

CATTLE

A CATTLE GRUB (Hypoderma sp.)

Missouri. L. Haseman (March 22): At Columbia some herds have dropped about all of their warbles while others, where we are testing treatment, are still carrying them.

HORSES

BUFFALO GNATS (Simulium spp.)

Mississippi. C. Lyle (March 23): Buffalo gnats are present in most of the counties bordering the Mississippi Delta. The gnats appeared in large numbers following the recent warm spell. Only a few deaths of animals have been re-

NOSE BOTFLY (Gastrophilus haemorrhoidalis L.)

Missouri. G. D. Jones (March 22): I should like to report the presence of the nose botfly in the following counties: Johnson, Cass, Lafayette, and Jackson.

AMERICAN WOOD TICK (Dermacentor variabilis Say)

Nebraska. M. H. Swenk (March 1 to 25): From Custer County during the second week in March came a complaint of colts being heavily infested with wood ticks. One colt was reported covered with them from the neck to the tail, at the rate of 6 to 20 per 9 square inches.

SHEEP

SHEEP TICK (Melophagus ovinus L.)

Michigan. R. Hutson (March 22): M. ovinus is unusually abundant on sheep.

POULTRY

DEPLUMING MITE (Onemidocontes gallinae Raill.)

Nebraska. M. H. Swenk (February 28): A Sioux County correspondent reported the prevalence of a depulming mite among her poultry in mid-February.

CHICKEN MITE (Derranyssus gallinae L.)

Nebraska. M. H. Swenk (February 28): In January poultry houses infested with the common chicken mite were reported from Fillmore and Madison Counties.

BEDBUG (Cimex lectularius L.)

Nebraska. M. H. Swenk (October 20, 1932, to February 28): The bedbug (C. lectularius) was reported as infesting poultry houses during January and February in Nuckolls and Howard Counties.

HOUSEHOLD AND STORED-PRODUCTS

INSECTS

TERMITES (Isoptera)

United States. T. E. Snyder (February): During February 83 cases of termite damage were reported to the Bureau of Entomology. The following list gives the number of cases reported from each section: Middle Atlantic, 33; South Atlantic, 11; East Central, 16; West Central, 3; North Central, 1; Lower Mississippi, 15; Pacific Coast, 3.

Virginia. H. B. Walker (March 25): We have received several reports of termites swarming in Norfolk buildings during the past two weeks.

Georgia. O. I. Snapp (March 16): Termites were swarming on this date, and a number of complaints of damage have been received at Fort Valley of the insects attacking foundation and floors of dwellings.

Florida. E. W. Berger (March 22): Termites were recently (early February) discovered swarming in Gainesville. J. C. Goodwin, Nursery Inspector, reports that one of the sororities at Tallahassee is having about three hundred dollars' worth of termite injury repaired.

Kentucky. W. A. Price (March 24): Many inquiries regarding termites have come from all sections of the State during the past few days. Termites were observed on the wing at Lexington on March 15.

Missouri. L. Haseman (March 22): At Columbia a number of cases of termites "swarming" have been observed.

Mississippi. C. Lyle (March 23): Swarms of termites are appearing in various parts of the State, and correspondents are requesting information about the control of these insects.

Louisiana. W. E. Hinds (March 26): Termite adults have swarmed in large numbers on two or more dates in March following warm rains. The general distribution and damage done by termites appears to be increasing quite steadily.

California. R. Bogue (March 9): Kiloterms minor Hazen and Reticulitermes hesperus Banks have been reported at Santa Fe Springs attacking a large factory to a damage of \$300, and much damage has been done to other manufacturing plants in this vicinity. (March 22): A large number of the houses in the area of the earthquake show a great deal of damage from termites and the damage will amount to thousands of dollars from this cause alone. A large amount of this damage could have been prevented by proper construction and careful inspection each year. (Los Angeles, Earthquake Area, southern California.)

#### EUROPEAN EARTWIG (Forficula auricularia L.)

Oregon. D. C. Mote (March 22): Female earwigs were observed with eggs the first week in March. (R. E. Dimick.)

#### CLOVER MITE (Bryobia pratensis Koch)

Nebraska. M. H. Swenk (October 20, 1932, to February 26): In Hall County there was a report of heavy invasion of a house with the clover mite during the past winter, these pests remaining in the house all winter.

#### AN ORTALID FLY (Anacampta latiuscula Loew)

Nebraska. M. H. Swenk (October 20 to February 26): From Sarpy County came the report of the emergence of large numbers of the fly A. latiuscula within the house during the middle of November. Three years ago, in February, we had a report of a similar sort from Washington County.

#### HOUSE CRICKET (Gryllus domesticus L.)

Maine. H. B. Peirson (March 22): March 1 there was a rather severe outbreak in an apartment house in Augusta of the European house cricket, G. domesticus.



A DERVESTID BEETLE (Thylodrias contractus Mots.)

Illinois. C. L. Metcalf (March 13): Several larvae of T. contractus were found in a closet of a house about a year and a half ago. They were present in at least 15 different packages of wedding gifts, especially amongst the tissue paper in the boxes. No injury has been noted from these insects, but their occurrence has been annoying throughout the dwelling, and the efforts of several professional exterminators have failed to eradicate the pest completely. Specimens of the larvae have been determined by E. A. Back.

WHITE-MARKED SPIDER BEETLE (Ptinus fur L.)

Alabama. J. M. Robinson (March 21): The drug-store beetle, P. fur, is moderately abundant in dwelling at Ft. Payne.

CADELLE (Tenebroides mauritanicus L.)

Nebraska. M. H. Swenk (October 20 to February 28): During the period here covered complaints have been steadily received of stored wheat and 2-year-old stored corn being infested with stored-grain pests, especially by the cadelle; these reports coming chiefly from south-central Nebraska, from Douglas, Lancaster, Seward, and Thayer Counties west to Kearney and Frontier Counties.

INDIAN-MEAL MOTH (Plodia interpunctella Wm.)

Nebraska. M. H. Swenk (October 20 to February 28): During the last week in January a Box Butte correspondent reported that his stored popcorn was heavily infested with the Indian-meal moth.

Oregon. D. C. Mote (March 22): The Indian-meal moth was reported infesting hop seed at Corvallis, March 21. (G. R. Hoerner.)

CIGARETTE BEETLE (Lasioderma serricorne Fab.)

Iowa. C. J. Drake (March 21): The tobacco beetle is very common this winter in the stuffing of upholstered furniture. It does much damage in Iowa each year and is widely distributed.

Correction: (Insect Pest Survey Bulletin, Vol. 13, No. 1, 1933), page 5, line 21, and page 26, line 30, the word "country" should read "state".

INSECT CONDITIONS IN COSTA RICA DURING 1932 AND EARLY 1933

C. H. Ballou

San Jose, Costa Rica

(Unless otherwise indicated, observations were made at  
San Pedro de Montes de Oca)

COCCIDAE<sup>1</sup>

Aulacaspis pentagona Targ. was seriously infesting peaches and plums during November, December, January, and February.

Ceroplastes floridensis Comst. was reported from September to March as more or less troublesome on a wide variety of fruit, among which might be mentioned quince, loquat, Poncirus trifoliatus, tangelo, orange, mandarin, and mango.

Chrysomphalus dictyospermi Morg. was very troublesome to sweet and sour oranges in February 1933. During the fall of 1932 it was reported as attacking rose and pecan.

Chrysomphalus personatus Comst. was found on orange in early September at Liberia, Province of Guanacaste.

Coccus hesperidum L. was very abundant throughout the year on mango, avocado, and sweet orange.

Coccus mangiferae Green. was reported on guava early in January 1933.

Icerya montserratensis R. & H. was found on rose at Limon, and on orange at San Pedro de Montes de Oca, in February 1933.

Lepidosaphes beckii Newm. is always a serious pest of orange. It is also found on orange—jasmine (Chalcas exotica), tangelo, and mandarin.

Lepidosaphes gloverii Pack. was collected on Plumeria rubra February 26, 1933.

Pseudonidia articulatus Morg. was found on orange leaf at Liberia, on August 20.

Pseudischnaspis bowreyi Ckll. was affecting rose at San Jose during August. It was also present on pecan during October, at San Pedro de Montes de Oca.

Pseudococcus citri Risso was destructive to orange, particularly nursery stock. It was also recorded from tangelo and mandarin.

Pseudococcus virgatus Ckll. This mealybug was found during November and December on croton (Codiaeum variegatum).

Pulvinaria psidii Mask. This species was reported throughout the fall, winter, and early spring, particularly on ylang-ylang (Canarium odoratum). It was also reported from Plumeria rubra, but not abundant on the latter plant.

Rhizoecus coffeae Laing was found on coffee roots at San Ysidro de Alajuela, May 28, 1932, where it was doing considerable damage. It was attended by the ant Lasius flavus nearcticus Wheeler.

During early November Saissetia hemisphaerica Targ. was reported as injuring the tender growth of isolated orange trees. It was also reported throughout the winter and early spring from croton, Poncirus trifoliatus, soursop, Pouteria caimito, cashew, citron, mandarin, persimmon (Diospyros kaki and D. virginiana), and balsam (Impatiens balsamina).

Saissetia nigra Nietz. was found on soursop (Annona muricata) at El Cacao on April 24, 1932, causing deformities of fruit.

Saissetia oleae Bern. was found on coffee, orange, cherimoya, persimmon (D. virginiana), and tangelo, during the late winter and early spring.

Trionymus sacchari Ckll. was abundant on sugarcane during mid-November, and was attended by the ant Wasmannia auropunctata Roger, which lives in colonies between the stalks and the leaf sheaths.

#### ALEURODIDAE

Aleurocanthus woglumi Ashby is always present on orange. It was also collected during late winter and early spring on avocado, croton, malacca pear (Eugenia malaccensis), roseapple (Eugenia jambos), lemon, mandarin, mango, citron, grapefruit, pitanga, and ylang-ylang.

#### APHIDIIDAE

During late April, 1932, Aphis gossypii Glov. was found on the leaves of Hibiscus rosae. It was attended by the ants Dorymyrmex pyramicus Roger<sup>1</sup> and Solenopsis geminata Fab.<sup>1</sup> During November this aphid was found to be doing damage to avocado.

Throughout the winter from October 1932 to February 1933 Aphis illinoisensis Shimer<sup>2</sup> was an important pest of grapes.

Aphis pomi DeG. was numerous during November on apples, pears, and quinces. It is considered as the worst enemy of quince at San Pedro de Montes de Oca.

Eriosoma lanigerum Hausm. was reported early in March, 1933, as being particularly harmful to apple.

The chermid Freysuila ernstii Schwarz<sup>3</sup> was found killing small trees of cedar (Cedrela glaziovii var. puberula) on the school ground at San Pedro de Montes de Oca from August to November. It was being attacked by the ladybird Neda retrospiciens Cr. During the early spring it was found on Cedrela montana var. mexicana which it was also damaging.

Rhopalosiphum pseudobrassicae Davis is an important winter pest of mustard.



Toxoptera aurantii Boyerl is a most serious pest of the mandarin orange, not only because of the direct injury, but as a transmitter of a serious disease that kills the tender shoots. Although the aphids occur throughout the trees, the disease is found only on the lower limbs, within 15 inches of the ground. The disease is especially destructive to newly budded stock and almost always follows an aphid attack. This aphid was abundant during November, December, and January. In addition to orange this insect is also very harmful to coffee and grapefruit.

#### MISCELLANEOUS HOMOPTERA

Aconophora pallescens Stal is the most serious pest with the exception of the Toxotrypana curvicauda Gerst. on papaya. It also damages quince, roseapple, orange, apple, and is found on coffee, elderberry, ylang-ylang, grapefruit, mandarin and mango.

Aethalion quadratum Fowl. is a membracid that breeds on avocado. It was found in numbers from November to February, and was also recorded from toronjo (Citrus decumana).

Aethalion reticulatum L. was collected on February 21 on poro (Gliricidia maculata).

Bolbonota inaequalis Fairm. breeds on soursop. It was found during December, January, and February on avocado, apple, coffee, croton, roseapple, cashew, and lemon.

Bolbonota insignis Fowl. was damaging mango during November, the tender shoots being covered with the nymphs. It also breeds on soursop and is found on avocado, cherimoya, and orange.

Cicadella areolata Sign. is always present on the leaves of arrowroot (Maranta arundinacea). During the end of November and the first part of December, rice suffered heavily from the feeding of this insect.

Cicadella laudata Walk. was collected on coffee, December 26, at Paso Ancho de San Sebastian.

Cicadella miniaticeps Fowl. was abundant during early November on clover.

Cicadella pardalina Fowl. was destructive to tender shoots of apple. It occasionally visits papaya, quince, roselle, grapefruit, and orange.

Cicadella prolixa Lethierry was collected early in November on avocado.

Cicadella sexlineata Sign. was abundant from August to February on geraniums and daisies.

Cicadella testudinaria Fowl. was collected on coffee during late December at Paso Ancho de San Sebastian and San Pedro de Montes de Oca. It has also been recorded from lemon, Casuarina equisetifolia, and fuchsia at San Pedro de Montes de Oca.

Colportera sinuata Burm. was collected on December 20 on avocado.

Diestostemma albinenne Fab. was found on orange, coffee, mulberry, and plum, but did not appear to do much damage.

Enchenopa lanceolata Stoll breeds on targua. This is a small tree from the latex of which is made a dentifrice.

Entylia sinuata Fab. is fairly common on cedar (Cedrela glaziovii var. puberula). It is also recorded from cucumber, eggplant, and potato.

Graphocephala coccinea Forst. was collected in February and March on avocado and apple.

Graphocephala urbana Stoll breeds on targua.

Graphocephala versuta Say was found during November, December, and January, on mango at Paso Ancho de San Sebastian and San Pedro de Montes de Oca. It is also recorded from coffee.

Gypona vulnerata Walk. was frequently found during November on the twigs of avocado. It is known to feed on quince and it has been found on coffee, potato, soursop, and orange; also on targua at Alajuelita.

Membracis mexicana Guer. is occasionally destructive to cherimoya. It is known from orange, ketembilla (Dovyalis hebecarpa), mango, quince, ylang-ylang, apple, avocado, camellia, nasturtium, pecan, soursop, pomegranate, lemon, mulberry, coffee, and roselle.

Micrutalis albivitta Fowl. breeds on targua. It was collected from November to January at both San Pedro de Montes de Oca and Alajuelita.

Monecphora bicincta Say was collected on para grass December 26 at Paso Ancho de San Sebastian.

Sphingophorus ballista Germ. is found on apple, coffee, quince, cherimoya, and soursop. It breeds on the soursop and occasionally damages the cherimoya.

Stictoccephala festina Say was abundant during November on red clover and was collected during December on rice.

#### HEMIPTERA

Acentoccephala declivis Say var. guatemalensis Dist. was collected during February and March, 1932, on sweet orange, lemon, and matasano.

Anasa scorbatica Fab. and Hypsilonotus atratus Dist. are rather harmful to chiberre.

Collaria oleosa Dist. was found damaging rice and wheat from December to February. It was a serious pest of wheat during the month of February.

Corythuca gossypii Fab. breeds on soursop. During February it was quite a pest of this crop.

Edessa cornuta Burm. occurred on mulberry during November.

Garraphia patricia Stal was taken on January 21, 1933, on tarqua at Alajuelita.

Halticus citri Ashm. was found on cucumber during November, and is also known to attack potatoes and tobacco.

Leptoglossus zonatus Dall. is a leaf-footed bug that does some damage to plant and fruit of pepper (Capsicum annuum), and is also found on apple, quince, cucumber, eggplant, avocado, tree-tomato (Cyphomandra betacea), orange, and mango.

Oncopeltus cingulifer Stal was collected on tarqua on January 21, 1933, at Alajuelita.

Stenomacra marginella H. S. is a particularly noxious pest of avocado. It is also recorded from ylang-ylang and coffee.

#### COLEOPTERA

Cleisa pedinoides Makl.<sup>1</sup> was found in rice straw at Santa Ana on October 5, 1932.

Cleistolophus similis Chev.<sup>2</sup> feeds on apple and caiba (Cyclanthera pedata). It was observed during late August and early September.

Colaspis prasina Jacoby was found attacking eggplant on November 12.

Colaspoides batesi Jac.<sup>3</sup> caused partial defoliation of uruca (Trichilia havenensis). It was collected September 30.

Cryptocephalus trizonatus Suffr.<sup>3</sup> was found eating the leaves of apple and is occasionally found on peach and guachipelin (Diphyssa robinoides).

Cycloneda sallei Muls.<sup>1</sup> was found during December, January, and February, eating the leaves of soursop. It was also found on avocado, and on a fern (Nephrolepis sp.)

Diabrotica balteata Lec.<sup>3</sup> was reported throughout the fall and winter attacking a variety of crops, and doing considerable damage to beans, cucumbers, and rice. It was also attacking Chiberre (Cucurbita ficifolia), plum, potato, tomato, turnip, wheat, apazote (Chenopodium ambrosioides), apple, beet, orange, peach, coffee, daisy (Chrysanthemum maximum), yellow dock (Rumex crispus), and blede (Amaranthus viridis).

Diabrotica nymphaealis Har.<sup>3</sup> eats the foliage of most fruit trees and vegetables, and occurred throughout the year. It does considerable damage to beans, and feeds on caiba, chayote, chiberre, eggplant, Job's tears, orange, peach, pear, plum, privet jasmine, dahlia, lemon, mandarin, rice, rose, Indigofera sp., coffee, avocado granadilla (Possiflora ligularis), Ageratum conyzoides, and yellow dock at Paso Ancho de San Sebastian.

(1) Det. E. A. Chapin. (2) Det. L. L. Buchanan. (3) Det. H. S. Barber.



From early October throughout the winter Diabrotica porracea Har.<sup>1</sup> has been troublesome to grapes. It has also been found on lemon and orange, and was recorded as doing some damage to potatoes during the winter.

Diabrotica vittata Fab. var. damages the leaves of chiberre, and is occasionally found in the blossoms of cucumber. During the fall it was so numerous on the chiberre vines that the beetles would rise in swarms when disturbed.

Epilachna borealis Fab.<sup>2</sup> was collected during late June damaging chayote. During late August it was found on caiba.

Epilachna virgata Muls.<sup>2</sup> badly chafes leaves of dama (Citharexylum caudatum). Observations were made in mid-September at Paso Ancho de San Sebastian.

Epilachna defecata Muls.<sup>2</sup> was found on aguacatillo (Phoebe tonduzii), a tree which we are trying out as a stock for avocado. The beetle chafes the leaves. Early in January it was also collected on tobacco.

During mid-November Epitrix fuscata Jac.-Duv. was the worst pest of potatoes. It was also damaging newly set tobacco plants, wheat, rice, and tomatoes.

Faula brunneipennis Bts.<sup>2</sup> was found on avocado and peach on May 27.

Geraeus lentiginosus Boh.<sup>3</sup> was damaging the tender shoots on isolated peach trees November 10.

The scarabaeid Gymnetis liturata Oliv.<sup>2</sup> eats the calluses at the union of the stock and cion in avocado grafts. It has also been collected from ylang-ylang, apple, and Acnistus arborescens.

Homotelus jansonii Cr.<sup>4</sup> eats the leaves of orange, apple, avocado, citron, and mango; It is rarely numerous enough to be important.

During mid-November Homophoeta aequinoctialis Linn.<sup>1</sup> was so numerous on the vines of chiberre that it rose in swarms when the vines were disturbed. It attacks a variety of plants including apple, cherimoya, orange, peach, pear, plum, coffee, kumquat, and croton.

Lechriops auritus Boh. was collected on balsa leaves September 12 at Paso Ancho de San Sebastian. An unidentified species of this genus has been collected on ylang-ylang and terciopelo (an ornamental vine) at San Pedro de Montes de Oca.

Macrodactylus lineatus Chev.<sup>2</sup> was destroying orange blossoms in Heredia on June 3, 1931. There were thousands of the beetles in each tree and they practically destroyed all of the blossoms.

Monocrepidius sexostulatus Champ.<sup>4</sup> is usually found between the leaves of avocado which have been webbed together by caterpillars.

Nodonota irazuensis Jac.<sup>1</sup> is very destructive to the flowers of roses; it is also found on pecan, cucumber, plum, rice, and coffee.

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(4) Det. W. S. Fisher.



Nodonota lateralis Jac.<sup>1</sup> is always a pest on apples. It also damages the flowers of dahlias and visits guachipelin, kapok (Ceiba pentandra), plum, and rice.

Oedionychis humeralis Fab.<sup>1</sup> and O. tenuicincta Jac.<sup>1</sup> are found on gladiolus at Paso Ancho de San Sebastian. Specimens were collected on August 18.

Pachybrachys femoratus Oliv.<sup>1</sup> was found eating apple leaves on November 12; and it occasionally visits yellow dock, Indigofera sp., and tarqua (Croton gossypifolium) at Alajuelita, and orange at San Pedro de Montes de Oca.

Pachystethus nitidula Bl.<sup>2</sup> eats the flowers of daisy (Chrysanthemum maximum) during early winter.

Phoraxonothe kirschi Reit.<sup>3</sup> was found damaging a package of seedless raisins during November.

Pterocyclon egenum Bldfd.<sup>4</sup> This borer killed a number of small avocado trees during October, November, and December. The adults are more destructive than the larvae. They bore into the trunks and branches and are the worst pest that I have observed on young trees.

Scymnus horni Gorr.<sup>2</sup> was observed during the winter feeding on Aleurocanthus woglumi Ashby.

Steirarrhinus cupreotinctus Champ.<sup>5</sup> was found on cedro dulce during August.

Strigoderma rutelina Bates<sup>2</sup> was damaging potato between the middle of November and middle of December.

Strigoderma sulcicollis Cast.<sup>2</sup> was collected on Polygonum sp. at San Jose during December.

#### DIPTERA

Pseudolynchia maura Bigot<sup>6</sup> is abundant and especially troublesome on young pigeons at San Jose. The natives believe that the pigeons can not live without them, and it is a common practice to kill one of these flies from a newly acquired pigeon in order to prevent the bird from returning to his old home.

Simulium metallicum Bell.<sup>7</sup> and S. quadrivittatum Loew<sup>7</sup> were collected on October 14 feeding on my hand while collecting at Las Pavas near San Jose. They leave a round spot that looks like a blood blister. The spot forms a dark colored scab. The bite is painful, especially if near the eye.

During November, December, and January Toxotrypana curvicauda Gerst. was the most serious pest of papaya, in many cases destroying 100 per cent of the fruit.

#### LEPIDOPTERA

Agraulis juno Cr.<sup>8</sup> was reared from a caterpillar on granada morada (Passiflora

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sp.) on August 23 at Paso Ancho de San Sebastian. From another pupa of this butterfly a new species of Tetrastichus<sup>1</sup> emerged on September 7.

Agraulis poeyi Butl.<sup>2</sup> was reared from a larva collected on November 14 on granadilla (Passiflora ligularis). This butterfly is an important pest of granadilla.

Argyrotaenia montezuma Wals.<sup>3</sup> was reared from a pale green caterpillar which is comparatively scarce on avocado leaves. The moth emerged November 2.

Caterpillars of Automeris boucardi Druce<sup>2</sup> are very important pests of apple. Between November 12 and December 18 they completely defoliated some small apple trees and did serious damage to persimmon (Diospyros kaki, D. virginiana). They also feed on the leaves of eggplant, mango, mulberry, and quince.

Azochia gripusalis Walk. is a borer on fig. Larvae were very destructive during November and December. An adult emerged from these larvae on January 4.

Bonchis munitalis Led.<sup>2</sup> make passages in the interior of the trunk of young roble de sabana (Couralia rosea). Their presence may be detected by small holes that communicate with the outside, one or two to each internode of the tree. Ants may usually be seen going in and out of these holes. An adult emerged from collected material September 5.

Hyphypena colnodes Wals.<sup>3</sup> was occasionally found on avocado. The larvae feed on the leaves and pupate where they feed. The insect is not abundant and causes but little damage. An adult emerged from collected material on November 19. From another pupa of this insect a hymenopterous parasite belonging to the sub-family Joppinae<sup>4</sup> emerged on September 1.

Hyposipyla grandella Zeller is an important pest of Cedrela montana var. mexicana. It was reported as doing considerable damage from November to February. It also fed on cedro amargo.

Jocara claudalis Mosch. caterpillars were abundant and destructive to avocado and continued so throughout the winter to late February.

Jocara subcurvalis Schs.<sup>2</sup> is a tent caterpillar. Tents were observed during November. An adult emerged from collected material on November 30. This insect is an important pest of avocado.

Larvae of Papilio anchisiades Esp.<sup>2</sup> appeared late in November on orange and continued to be destructive to orange, lemon, and mandarin to mid-February.

Papilio polydamas L.<sup>2</sup> was reared from a larva collected on Aristolochia sp. at Paso Ancho de San Sebastian. The larva pupated April 11, 1931 and the adult emerged May 2.

Papilio polyxenes Drury was collected on January 13 on Coriander.

Pieris elodia Bvd.<sup>2</sup> causes considerable havoc to nasturtiums during the late fall. An adult emerged from collected larvae on October 4. This species attacks cabbage, cauliflower, kohlrabi, turnip, and cucumber.

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Rothschildia lebeani Guer.<sup>1</sup> Adults were observed ovipositing on the leaves of mombin (Spondias purpurea). A larva transformed and the adult emerged on January 30, 1932. The parent of this larva emerged on August 31, 1931, mated September 1 to 4, laid eggs September 4, the eggs hatched September 15, the larvae molted September 28, October 5, and October 14, and pupated November 28, 1931.

Stenoma sororia Zell. Early in November the caterpillars practically disappeared from avocado. Toward the middle of December the next brood of larvae were beginning to appear. During January they were an important pest of avocado and continued as such during February. The larvae feed on the tender shoots.

Sterieta albifasciata Druce was collected on avocado on January 20.

A new species of Walshia<sup>2</sup> was reared from a gall on Diphysa robinoides on November 22. Another individual emerged on November 30. Adults have also been obtained during August and September from these galls.

### ORTHOPTERA<sup>3</sup>

Chloroscirtus forceps S. & P. is a minor pest of orange. Specimens were collected September 1.

Cocconotus ravus Rehn is very destructive to foliage and tender twigs of orange. During the day they are found hiding in the upper end of bamboo stakes that are used to tie up young bamboo trees. These bamboo stakes are usually filled with rain water and the insects are often found with their bodies entirely submerged with the exception of the antennae. They also attack sugarcane, geranium (Pelargonium spp.), and Dracaena fragrans.

Doru lineare Esch. is an earwig that was found in stored immature corn, eating the immature kernels, on September 24.

Rhipipteryx biolleyi Sauss. has been observed on coffee, cucumber, rice, and turnip, but apparently does not do much damage.

Taeniopoda varipennis Rehn was found during November as an important pest of geranium.

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## SUMMARY OF INSECT CONDITIONS IN BRAZIL FOR 1932

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(Unless otherwise indicated, notes refer to Minas Geraes)

SUGARCANE

A sugarcane froghopper, Tomaspis liturata Lep. et Serv., without doubt was responsible for heavier losses in the Bonte Nova and Rio Branco zones this year. From February to May the damage was more noticeable when the foliage turned yellow and poor growth resulted. Growers are inclined to believe that the better mosaic-resistant varieties are more seriously attacked. Five species of other grasses growing in and near cane fields have been found to harbor and serve as successful food plants. In the State of Rio de Janeiro this insect also caused serious losses in the cane fields. (C. Moreira.)

Another sugarcane froghopper, T. indentata Walk., is evidently causing more injury than has been accredited to it heretofore. This species is widely distributed in this section of the State. It confines its feeding to the foliage while T. liturata feeds on the roots, near the surface of the soil.

The sugarcane aphid, Aphis sacchari Zehnt., was observed this year for the first time in Ponte Nova, Rio Branco, and Vicosa. The infestation was quite generally distributed in Rio Branco, where considerable losses resulted.

Pseudococcus spp. were more commonly encountered this season than heretofore in Vicosa sugarcane.

Several specimens of Mahanarva indicata Walk. were intercepted at the College this year in a small shipment of seed cane from Campos, State of Rio de Janeiro. This froghopper has not yet been observed in Vicosa.

The sugarcane borer, Diatraea saccharalis Fab., was common through most of the growing season but did not cause serious losses. In fact several growers reported it as being less abundant in several varieties this year. During April three egg masses of Diatraea were found parasitized by Trichogramma sp.

The West Indian cane weevil, Metamasius hemipterus L., caused complete loss in several hectares of newly planted cane in Rio Branco during February. In Vicosa this species has been observed only in banana. This insect caused considerable loss in a small banana planting at the College during July.

Two species of Thysanoptera, yet unidentified, were encountered in abundance in young cane at the College from March to May.

A sugarcane stalk mite, probably belonging to the genus Tarsonemus, has been found to be quite common in the variety F. O. J. 2714. It causes small blisters on the stalks while these are still covered by the leaf sheaths.



Practically 100 per cent infestation occurred in the College plots this past year. Growers have been considerably alarmed over the appearance of this mite but are now beginning to believe that it is of little importance.

A mite that has attracted more attention is one of the leaf mites, Tetranychus sp., observed for the first time in the following varieties: P.O.J. 2725, 272 and 2878. One field of 2725 was found with about one-half of the cane leaves moderately to heavily infested during February.

### COFFEE

The coffee "broca," Stephanoderes hampei Ferr., was observed for the first time in the State of Minas Geraes on February 8, 1932. Undoubtedly the insect has become slowly established in most of the counties bordering the State of Sao Paulo during the past few years. However, not until the above date had there been any suspicion that the insect was present; it had disseminated over quite a large area. A survey was initiated in southern Minas Geraes during April and up to the present writing (January 31, 1933) 33 counties have been found to be infested through the more important coffee zones of the State. Injury to the 1933 crop will undoubtedly be quite marked in the more heavily infested groves where means of control have not yet been undertaken.

The green scale, Coccus viridis Green, has received more attention by coffee growers this season. Many younger plantations were heavily infested toward the end of the year. The coccinellid Azya luteipes Muls. and the fungus Acrostala albus Fr. proved of great benefit in holding the scale in check during the wet season.

### COTTON

The pink boll worm, Pectinophora gossypiella Saund., continues to be the most important cotton pest in this part of Minas. In spite of the fact that all possible means of reducing the infestation from one year to the next are thoroughly practiced, severe losses occur annually in Vicosa. Counts made in July on the College grounds showed 60 to 80 per cent infestation of bolls. According to C. Moreira, this insect is common in the principal cotton-growing regions of Brazil but is not responsible for serious losses.

The cotton leaf worm, Alabama argillacea Hbn., appeared during January 1932 in very small numbers. During the previous year parasites of the genera Spilochalcis and Microgaster (det. C.F.W. Muesebeck) reduced the infestation to a minimum. For this reason we are of the opinion that very few adults escaped to infest the plantings of 1932. The cotton worm may be found widely distributed throughout Brazil.

The cotton aphid, Aphis gossypii Glov., was present from March to harvest time but never increased to such an extent as to warrant control measures. The coccinellid Neda sanguinea L. was present in large numbers feeding on the aphids.

Dysdercus fernaldi Ballou and Euryophthalmus humilis Drury were both very common again this season in the cotton plots at the College. These "percevejos" undoubtedly are important agents in the transmission of anthracnose and other cotton diseases. Practically 100 per cent of the bolls were fed upon by these insects.

The cotton "gorgulho," Gasterocercodes gossypii Pierce, caused serious losses in the State of Sao Paulo. (Moreira.) In Minas Geraes the weevils were very abundant during the growing season, having been observed for the first time in late January at Vicosa.

### CITRUS FRUIT

The fruit flies Ceratitis capitata Wied. and Anastrepha fraterculus Wied. continued to cause even more losses to citrus this season where no spraying was done in Minas Geraes. In the spray plots against the flies, the infestation was maintained at almost a minimum. The more susceptible citrus varieties, unsprayed, dropped many fruits before harvest. The Mediterranean fruit fly was reared from a number of pears for the first time during March, 1933, at Vicosa. In the State of Sao Paulo, Ceratitis and Anastrepha were less common than usual in the citrus groves, especially in the northern part of the State. C. capitata showed quite a preference for the coffee berries in that State (C. Moreira.)

Lepidosaphes beckii Newm., Hemichionaspis aspidistrae Sign., and Coccus viridis Green were the most common scale insects observed in citrus groves during this season. Minas Geraes.

Scattered infestations of Saissetia oleae Bern. were observed in the citrus nursery during May. Later, upon further examination, specimens were taken throughout the groves. This was the first occasion we have had to observe it on citrus here at Vicosa. A great majority of adult scales were found to have been parasitized by two species of Hymenoptera. No noticeable increase in population could be ascertained.

The black citrus aphid, Toxoptera aurantii Boyer, was far more common this year in the school orchards. Considerable damage was done to nursery stock ready for shipment..

Many citrus fruits growing on young trees were badly damaged by Schistocerca flavofasciata DeG. during April and May. Little destruction occurred in the groves on higher elevations.

Two species of thrips appeared to be quite numerous in citrus this year. Although yet unidentified, they constitute major pests in this section. Injury before harvest time was quite noticeable and by the end of the season the percentage of scarred fruits ran very high as compared to other years.

In December, several 6-year-old citrus trees were killed by larvae of Cratichneumon reidi Kby. in small plantings near Vicosa. Adults are not very often encountered in citrus groves in this region.

Numerous leafhoppers have been collected from time to time on citrus. None of the species have as yet been identified.

Larvae of Sibine nesea Stoll, which feed on the foliage of citrus and plum, were found for the first time devouring the leaves of castor bean in December.

Macroductylus suturalis Mann. was found feeding on orange blossoms in the Federal District. (C. Moreira.)

A citrus mite, probably Phyllocoptes oleivorus Ashm., was responsible for the russetting of many fruits. These mites are generally distributed in Brazil, especially in older groves and on trees that receive no treatment whatsoever.

#### APPLE, PEAR, & QUINCE

The West Indian fruit fly, Anastrepha fraterculus Wied., destroyed 95 per cent of the apples growing in the College orchards during February.

The scale Aspidiotus lataniae Sign. is the only scale insect observed so far on apple in this part of the State.

The black scale, Saissetia oleae Bern., was found on pear in September.

Three quince trees were found lightly infested with the scale Tachardia cydoniae Hempel in April.

Eriosoma lanigerum Hausm. has been encountered in the States of Sao Paulo, Rio Grande do Sul, Minas Geraes, and the Federal District. It seems reasonable to believe that the parasite Aphelinus mali Hald. has prevented this aphid from making further spread in Brazil. (C. Moreira.)

#### PEACH

The San Jose scale, Aspidiotus perniciosus Comst., until the present time confined to the States of Rio Grande do Sul and Parana, has appeared on peach in the State of Rio de Janeiro. (C. Moreira.)

The white peach scale, Aulacaspis pentagona Targ., was very common on both peach and mulberry. The parasite Prospaltella berberi How. which now exists in Brazil is almost always found parasitizing these scale insects. (C. Moreira.)

A small infestation of Anuraphis prunicola Kalt. was found on a dozen peach trees during May at Vicosa. This aphid also occurred in Maria de Fe in February.

Two species of Acanthoderes were very common on the trunks of peach trees during November.

#### GRAPE

The grape phylloxera, Phylloxera vitifoliae Fitch, still remains confined in the States of Rio Grande do Sul, Santa Catarina, and a small area in Sao Paulo. (C. Moreira.)

#### AVOCADO

Coccus hesperidum L. and Saissetia oleae Bern. were observed for the first time this year attacking avocado trees in Vicosa.



## PINEAPPLE

Pineapple foliage is commonly infested by Diaspis bromeliae Bouche throughout this part of Minas Geraes.

## MISCELLANEOUS FRUIT

Saissetia hemisphaerica Targ. and S. oleae Bern. are occasionally found infesting various Annonaceae.

The curculionid Heilipus catagraphus Gern. was taken many times during January, August, and November feeding on the foliage of the Annonaceae, Fruta de Conde. This borer is responsible for serious losses in several varieties of fruit.

The whitefly Dialeurodicus cockerelli Quaint. was the most common insect observed on the foliage of Arasa. Anastrepha fraterculus Wied. did not seriously injure the fruits from these trees this season.

Adult cerambycids, Trachyderes succinctus L. and T. striatus Fab., were collected many times while feeding on the ripened fruits of a Japanese persimmon.

The fruit flies, Ceratitis and Anastrepha were taken on Surinam cherry during September.

Adults of Entimus imperialis Forst. were observed feeding on the foliage and fruits of the Brazil nut (castanha do Para) at Ponte Nova during January. (Det. L. L. Buchanan)

## TOMATO

A tomato worm, Leucinodes elegantalis Guen., was generally present and caused some injury to tomato this year but owing to the small crop no definite information could be collected.

A plant bug, Phthia picta Drury, was more common this season in tomato plantings. Nymphs and adults destroyed many fruits, thus influencing fungus infection during the dry season.

Two bugs, Arvelius albopunctatus DeG. and Acrosternum bipunctula Stal, were collected from tomato during June. (Det. H. G. Barber.)

A chrysomelid, Diabrotica speciosa Germ., very common on a great variety of crops, was exceptionally injurious to tomato fruits. The beetles eat out cavities in the young fruit.

## SWEETPOTATO

Nymphs and adults of Coreocoris fusca Thunb. were taken while feeding on wild sweetpotato plants in January. (Det. H. G. Barber.)



The sweetpotato weevil Euscepes batatae Waterhouse caused as high as 14 per cent losses in the more important varieties of sweetpotato in the College plots this season.

### IRISH POTATO

The tobacco leaf-miner, ~~Grapholita~~ operculella Zell., absent during the growing season, appeared after harvest, infesting the second growth of Irish potato or "suckers" in one planting at the College. This insect has not been observed in potatoes at Vicosa.

In an Irish potato planting of approximately 5 acres, a species of Pseudococcus was found infesting the roots during November. By mid-December the entire field was infested and serious loss resulted in the final yield.

Two species of Epicauta are occasionally found feeding on Irish potatoes in Minas Geraes.

The potato flea beetle, Epiditrix cucumeris Harr., was present throughout the latter half of the growing season but was of very little importance in nearby potato fields.

### EGGPLANT

In January, adults of Phrydenus muricens Germ. were taken a number of times on eggplant. Larvae were not observed on the roots of the same plants despite the fact that careful search was made for them.

A chrysomelid, Colaspis sp., is quite a serious pest of eggplant. Larvae feed on the roots, and the adults consume quantities of the foliage, eating out large holes, thus weakening the plants to such an extent that they fail to produce.

### ONIONS

The onion thrips, Thrips tabaci Lind., was very common in onion beds from August until October, 1932.

### CABBAGE

A dipterous leaf-miner, probably Agronyza sp., was very numerous in cabbage and "couve" plantings throughout the season. The same species was reared many times from wild mustard.

The cabbage aphid, Brevicoryne brassicae L., was occasionally observed but never in sufficient numbers to warrant control measures.

The diamond back moth, Plutella maculipennis Curtis, was common all year attacking preferably "couve" rather than cabbage grown side by side.

### BEANS

Larvae of Lamprosema indicata Fab. (Det. W.T.W. Forbes) appeared in March and until June caused slight losses in beans. The moths are very numerous at lights. Minas Geraes.

A thrips, probably Heliothrips fasciatus Perg., is very common in beans and other plants, especially during January.

A species of Epicauta was encountered feeding on the foliage of beans during November.

### MELONS

Two coccinellids, Epilachna clandestina Muls. and E. spreta Muls., are generally present in all squash plantings. Both species were observed on watermelon foliage during December.

The cotton aphid, Aphis gossypii Glov., appeared early in two melon plantings and caused serious injury to the young plants. Control measures were necessary. In cucumbers the aphid was not seen in great numbers.

Diabrotica speciosa Germ., D. bivittula K., and a species of Colaspis often cause serious losses in young squash plantings during November and December.

The melon worm, Diaphania hyalinata L., was observed for the first time feeding on the foliage of pumpkin here in Vicosia during January. D. nitidalis Stoll was seen many times at lights but never observed in the field.

A cecidomyiid, probably Eudiplosis brasiliensis (Rbs.), infests the foliage of manioc causing characteristic galls.

### TOBACCO

The flea beetles Epitrix parvula Fab. and E. cucumeris Harr. caused serious losses to tobacco during April at Vicosia. The infestation this year was the worst that has occurred in the past three seasons.

Larvae of Phlegethontius sexta Johan. were not able to damage tobacco foliage to any extent owing to the fact that their natural enemies held them well in check.

Two capsids, Engytatus spp., were very abundant but never of any real importance as tobacco pests.

A reduviid, Apiomeris lanipes Fab. (det. H. G. Barber), may be seen posing on the leaves of tobacco plants during March and April. These bugs are known to kill and feed on the honeybee.

### MISCELLANEOUS PLANTS

Two bamboo scales, Asterolecanium bambusae Bdv. and A. miliaris Bdv., are very common wherever bamboo is grown in this region.



Several young tea trees were found infested with Chrysomphalus aonidum L. and Ceroplastes floridensis Comst. during late September.

A weevil, Pseudonachynerus brasiliensis Thunb. (det. H. S. Barber), was found to have destroyed 20 per cent of the seeds of Macuna in a small lot of seed for planting. This species is not very common at Vicosa.

The West Indian fruit fly, Anastrepha fraterculus Wied., is the worst insect enemy of the goiaba fruit. None of the other fruit flies have been reared from these fruits.

One small goiaba tree was found badly infested with Ceroplastes grandis Hempel and Aspidiotus lataniae Sign. (Det. A. Hempel.)

A coccid, Pendularia pendens Fons., was observed for the first time on the smaller twigs of the jaboticaba tree here at Vicosa during May. Anastrepha fraterculus Wied. flies were also seen on the fruits of this same tree in October at Ponte Nova, Minas Geraes.

The palm aphid, Cerataphis lataniae Bdv., seriously infested several hundred palms (Xanthophoenix alexandria) on the school property during August and September. The infestation was quickly reduced after two applications of kerosene emulsion.

A weevil, Hadropus albicaris Germ., was taken many times from the jacaranda tree. (Det. L. L. Buchanan.)

Eggs, larvae, and adults of Psyllobora confluens Fab., a phytophagous coccinellid, were taken on the leaves of a "nanoeiro" plant in November. This coccinellid is known to feed on the fungus Asperisporium carecae and anthracnose which infests this fruit.

Adults of Anastrepha fraterculus Wied. were reared from the seed pods of a leguminous plant, Ira sp., during March.

Adults of Phaedon confinis Stal completely destroyed a small planting of crotalaria during January. The beetles are common feeders on a number of plants.

#### CORN AND SORGHUM

The corn aphid, Aphis maidis Fitch, caused injury to field corn during January and February. The infestation was quite severe in about 2 acres of one field where many plants were literally covered by the aphids. The aphids were also taken in sorghum at the same time.

The formiga sauva, Atta sexdens L., continues as one of the worst pests of Brazil. County organizations in several localities are already in existence doing good service among the farmers. (C. Moreira.)